INCH-POUND

MIL-PRF-32140/1
14 January 2004

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, RADIO FREQUENCY,
DC to 6 GIGAHERTZ, ESTABLISHED RELIABILITY, DPDT,
LOW LEVEL TO 1.0 AMPERE, HERMETICALLY SEALED

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-32140.

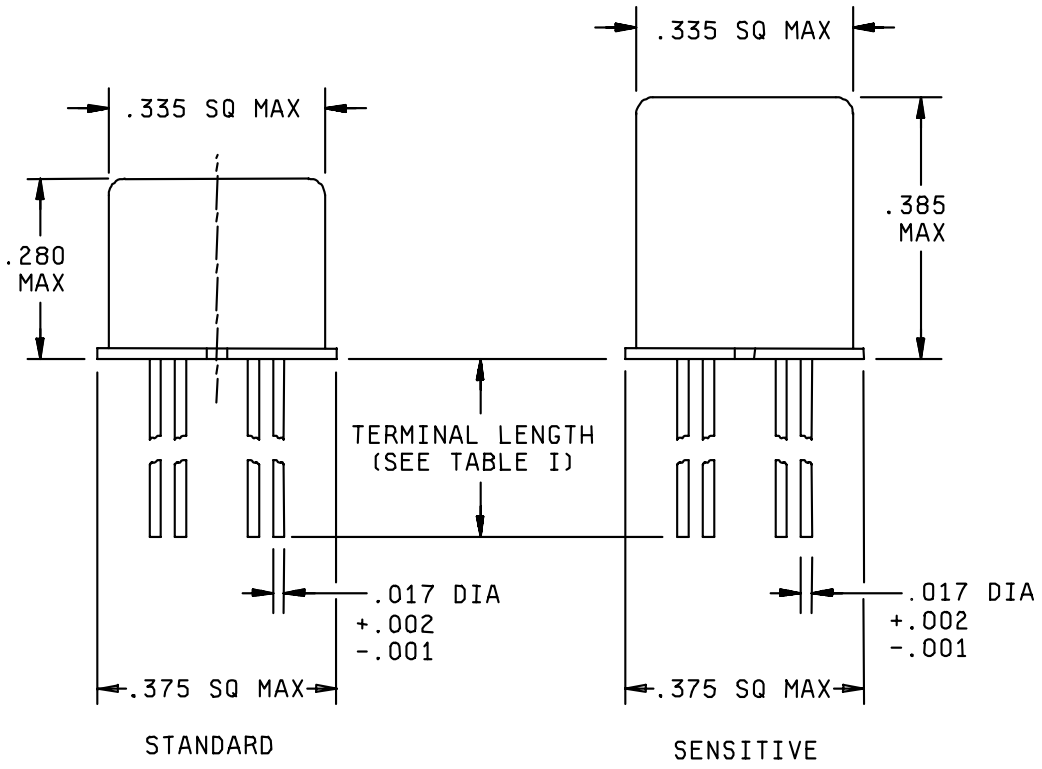
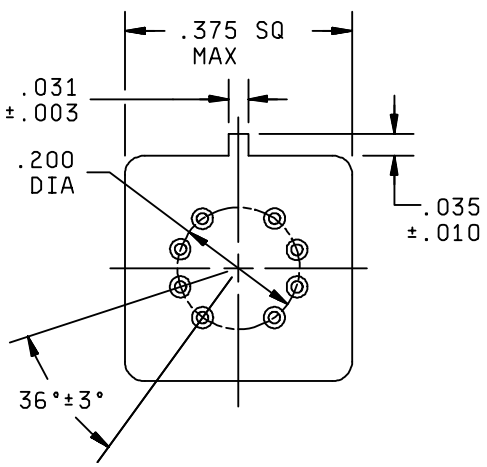
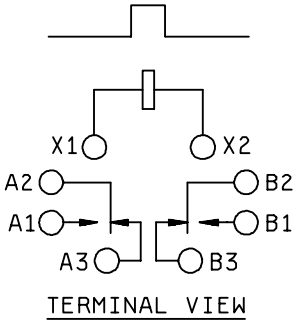


FIGURE 1. Dimensions and configurations.



HEADER VIEW



TERMINAL VIEW

Inches	mm	Inches	mm
.001	0.03	.200	5.08
.002	0.05	.280	7.11
.003	0.08	.335	8.51
.010	0.25	.375	9.53
.017	0.43	.385	9.78
.031	0.79	.750	19.05
.035	0.90		
.187	4.75		

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± .010 (0.25mm).
4. Circuit diagram shown on part is the terminal view.
5. Terminals shall provide the operational, environmental, and interface characteristics to provide a reliable interconnect to gold-plated contacts. Terminals shall be gold plated. One system for gold plating that may be used is ASTM B488, type 3, class 1.25 with a nickel underplate of 50 to 150 microinches thick. The gold plating system shall enable the product to meet the performance requirements of this specification and shall be approved by the qualifying activity.

FIGURE 1. Dimensions and configurations - Continued.

REQUIREMENTS:

PHYSICAL REQUIREMENTS:

Dimensions and configurations: See figure 1.

Weight:

Standard: 0.11 ounces (3.12 grams) maximum.

Sensitive: 0.13 (3.67 grams) maximum.

Solderability: Applicable.

CONTACT REQUIREMENTS:

Load ratings:

High level (relay case grounded):

Resistive: 1.0 ampere at 28 V dc.

Inductive: 0.2A at 28 V dc with 0.32 henry inductance.

Low level: 10 µA to 50 µA at 50 mV dc.

Intermediate current: Not applicable.

Contact resistance: 100 milliohms maximum.

Contact bounce: 1.5 milliseconds maximum.

Contact stabilization time: 2.0 milliseconds maximum.

Overload (high level only): Two times rated current.

ELECTRICAL AND PERFORMANCE REQUIREMENTS: See table I.

TABLE I. Electrical and performance requirements. 1/

Dash numbers 2/			Coil voltages (V dc) 3/		At +25°C				Over the temperature range		
Lead length .187 ±.010	Lead length .750 min.	Coil type	Rated	Max.	Coil resistance ohms ±10%	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)
001	013	Standard	5.0	5.8	50	2.7	1.4	0.22	3.5	2.3	0.14
002	014	Standard	6.0	8.0	98	3.5	2.0	0.28	4.5	3.2	0.18
003	015	Standard	9.0	12.0	220	5.3	3.0	0.54	6.8	4.9	0.35
004	016	Standard	12.0	16.0	390	7.0	4.0	0.63	9.0	6.5	0.41
005	017	Standard	18.0	24.0	880	10.5	6.0	0.91	13.5	10.0	0.59
006	018	Standard	26.5	32.0	1560	14.2	8.0	1.37	18.0	13.0	0.89
007	019	Sensitive	5.0	7.5	100	2.6	1.4	0.23	3.5	2.5	0.12
008	020	Sensitive	6.0	10.0	200	3.4	2.0	0.28	4.5	3.2	0.18
009	021	Sensitive	9.0	15.0	400	4.85	3.0	0.55	6.8	4.9	0.35
010	022	Sensitive	12.0	20.0	850	7.0	4.0	0.64	9.0	6.5	0.41
011	023	Sensitive	18.0	30.0	1600	9.8	6.0	0.92	13.5	10.0	0.59
012	024	Sensitive	26.5	40.0	3300	14.0	8.0	1.40	18.0	13.0	0.89

1/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuits not recommended for subsequent use in low level applications.

2/ The suffix letter A, B, or C to designate the applicable failure rate level shall be added to the applicable dash number. Failure rate level or general purpose designator: A, 1 million cycles; B, 5 million cycles; C, 20 million cycles; G, general purpose military applications. Example, 001A -------024G.

3/ CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.

Insertion loss (dB):

Frequency	Initial	Post life
1 GHz	.15 max.	.20 max
2 GHz	.20 max.	.25 max
3 GHz	.25 max.	.30 max
4 GHz	.35 max.	.40 max
5 GHz	.40 max.	.45 max
6 GHz	.60 max.	.65 max

Voltage standing wave ration (VSWR):

Frequency	Initial	Post life
1 GHz	1.2 max.	1.25 max.
2 GHz	1.2 max.	1.25 max.
3 GHz	1.2 max. .	1.25 max.
4 GHz	1.3 max. .	1.35 max.
5 GHz	1.4 max. .	1.45 max.
6 GHz	1.4 max. .	1.45 max.

Isolation (dB):

Frequency	Between contacts	Between poles
1 GHz	-25 min.	-35 min.
2 GHz	-20 min.	-30 min.
3 GHz	-20 min.	-30 min.
4 GHz	-20 min.	-30 min.
5 GHz	-20 min.	-30 min.
6 GHz	-20 min.	-30 min.

Rated RF power (at 25°C): 5 watts maximum.

Frequency range: DC to 6 Gigahertz.

Operate Time:

Standard: 2.0 ms maximum with rated coil voltage over the temperature range.

Sensitive: 4.0 ms maximum with rated coil voltage over the temperature range.

Release Time:

Standard: 1.5 ms maximum (each coil), with rated coil voltage over the temperature range.

Sensitive: 2.0 ms maximum (each coil), with rated coil voltage over the temperature range.

Duty rating: Continuous.

Insulation resistance: 10,000 megohms minimum at 500 V dc, except the resistance between the coil and case at high temperature shall be 1,000 megohms minimum at 500 V dc.

Dielectric withstanding voltage:

	Initial Sea level V rms (60 Hz)	After life test Sea level V rms (60 Hz)	Altitude V rms (60 Hz)
Between case, frame, or enclosure and all contacts in the energized and de-energized positions.	500	500	
Between case, frame, or enclosure and coils.	500	500	125
Between all contacts and coils.	500	500	All terminals
Between open contacts in the energized and de-energized positions.	500	375	to case
Between contact poles.	500	500	

LIFE TEST REQUIREMENTS:

High level: Applicable.

Low level: Applicable.

ENVIRONMENTAL CHARACTERISTICS:

Temperature range: -65°C to +125°C.

Maximum altitude rating: 300,000 feet.

Shock (specified pulse): Applicable, MIL-STD-202, method 213, test condition C, except peak value shall be 75 g's for 6 ±1 ms, half-sine pulse. Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Vibration (sinusoidal): Applicable, MIL-STD-202, method 204, 30 g's, except frequency range shall be 10 to 3,000 Hz. Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Vibration (random): Applicable to qualification and group C inspection. Test in accordance with MIL-STD-202, method 214, test condition IG (0.4 g^2/Hz, 50 to 2,000 Hz). Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Acceleration: Applicable.

Salt atmosphere (corrosion): In accordance with method 1041, MIL-STD-750.

Seal: Hermetic.

Part or Identifying Number (PIN): M32140/1 with dash number from table I and suffix letter designating failure rate level or general purpose military applications (Example: M32140/1-001A or M32140/1-001G).

Referenced documents. In addition to MIL-PRF-32140, this document references the following:

MIL-STD-202
MIL-STD-750
ASTM B488

Custodian:
Army - CR
Navy - EC
Air Force -11
DLA - CC

Preparing activity:
DLA - CC

(Project 5945-1215-01)

Review activities:
Army - AV, MI
Air Force - 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at www.dodssp.daps.mil.